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Bulletin I20202 rev. E 03/04

International IOR Rectifier

70HF(R) SERIES

STANDARD RECOVERY DIODES

Stud Version

Features

- High surge current capability
- Designed for a wide range of applications
- Stud cathode and stud anode version
- Leaded version available
- Types up to 1600V V_{RRM}

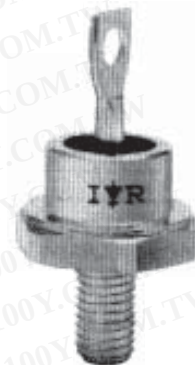
Typical Applications

- Battery charges
- Converters
- Power supplies
- Machine tool controls

70 A

Major Ratings and Characteristics

Parameters	70HF(R)		Units
	10 to 120	140 to 160	
$I_{F(AV)}$	70	70	A
@ T_C	140	110	°C
$I_{F(RMS)}$	110		A
I_{FSM}	@ 50Hz	1200	A
	@ 60Hz	1250	A
I^2t	@ 50Hz	7100	A ² s
	@ 60Hz	6450	A ² s
V_{RRM}	range	100 to 1200 1400 to 1600	V
T_J	range	- 65 to 180 - 65 to 150	°C



case style
DO-203AB (DO-5)

70HF(R) Series

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IR Rectifier

ELECTRICAL SPECIFICATIONS

Voltage Ratings

Type number	Voltage Code	V_{RRM} , maximum repetitive peak reverse voltage V	V_{RSM} , maximum non-repetitive peak reverse voltage V	$V_{R(BR)}$, minimum avalanche voltage V	I_{RRM} max. @ $T_J = T_J \text{ max.}$ mA
70HF(R)	10	100	200	200	15
	20	200	300	300	
	40	400	500	500	
	60	600	720	725	9
	80	800	960	950	
	100	1000	1200	1150	
	120	1200	1440	1350	
	140	1400	1650	1550	4.5
	160	1600	1900	1750	

Forward Conduction

Parameter		70HF(R)		Units	Conditions		
		10 to 120	140 to 160				
$I_{F(AV)}$	Max. average forward current @ Case temperature	70	70	A	180° conduction, half sine wave		
		140	110	°C			
$I_{F(RMS)}$	Max. RMS forward current	110		A	Sinusoidal half wave, Initial $T_J = T_J \text{ max.}$		
I_{FSM}	Max. peak, one-cycle forward, non-repetitive surge current	1200		A			
		1250					
		1000					
		1050					
I^2t	Maximum I^2t for fusing	7100		A^2s	t = 10ms	No voltage	
		6450			t = 8.3ms	reapplied	
		5000			t = 10ms	100% V_{RRM}	
		4550			t = 8.3ms	reapplied	
I^2vt	Maximum I^2vt for fusing	71000		A^2vs	t = 0.1 to 10ms, no voltage reapplied		
$V_{F(TO)1}$	Low level value of threshold voltage	0.79		V	$(16.7\% \times \pi \times I_{F(AV)}) < I < \pi \times I_{F(AV)}$, $T_J = T_J \text{ max.}$		
$V_{F(TO)2}$	High level value of threshold voltage	1.00			$I > \pi \times I_{F(AV)}$, $T_J = T_J \text{ max.}$		
r_{f1}	Low level value of forward slope resistance	2.33		mΩ	$(16.7\% \times \pi \times I_{F(AV)}) < I < \pi \times I_{F(AV)}$, $T_J = T_J \text{ max.}$		
r_{f2}	High level value of forward slope resistance	1.53			$I > \pi \times I_{F(AV)}$, $T_J = T_J \text{ max.}$		
V_{FM}	Max. forward voltage drop	1.35	1.46	V	$I_{pk} = 220A$, $T_J = 25^\circ C$, $t_p = 400\mu s$ rectangular wave		

Thermal and Mechanical Specifications

Parameter		70HF(R)		Units	Conditions
		10 to 120	140 to 160		
T _J	Max. junction operating temperature range	-65 to 180	-65 to 150	°C	
T _{stg}	Max. storage temperature range	-65 to 180	-65 to 150		
R _{thJC}	Max. thermal resistance, junction to case	0.45		K/W	DC operation
R _{thCS}	Max. thermal resistance, case to heatsink	0.25			Mounting surface, smooth, flat and greased
T	Max. allowed mounting torque ±10%	2.3 - 3.4		Nm	Not lubricated threads
		20 - 30		lbf • in	
wt	Approximate weight	17 (0.6)		g (oz)	
Case style		DO-203AB (DO5)			See Outline Table

ΔR_{thJC} Conduction

(The following table shows the increment of thermal resistance R_{thJC} when devices operate at different conduction angles than DC)

Conduction angle	Sinusoidal conduction	Rectangular conduction	Units	Conditions
180°	0.08	0.06	K/W	$T_J = T_J \text{ max.}$
120°	0.10	0.11		
90°	0.13	0.14		
60°	0.19	0.20		
30°	0.30	0.30		

Ordering Information Table

Device Code				
70	HF	R	160	M
1	2	3	4	5
1 - 70 = Standard device 71 = Not isolated lead 72 = Isolated lead with silicone sleeve (Red = Reverse polarity) (Blue = Normal polarity) 2 - HF = Standard diode 3 - None = Stud Normal Polarity (Cathode to Stud) R = Stud Reverse Polarity (Anode to Stud) 4 - Voltage code: Code x 10 = V_{RRM} (See Voltage Ratings table) 5 - None = Stud base DO-203AB (DO-5) 1/4" 28UNF-2A M = Stud base DO-203AB (DO-5) M6 X 1				

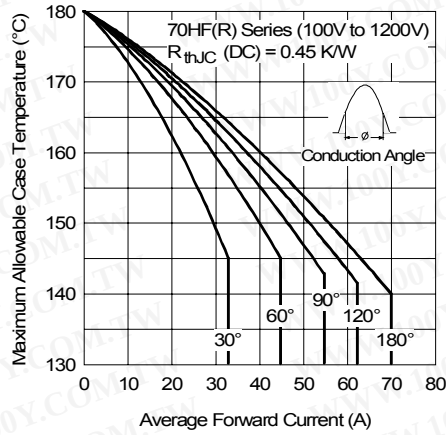


Fig. 1 - Current Ratings Characteristics

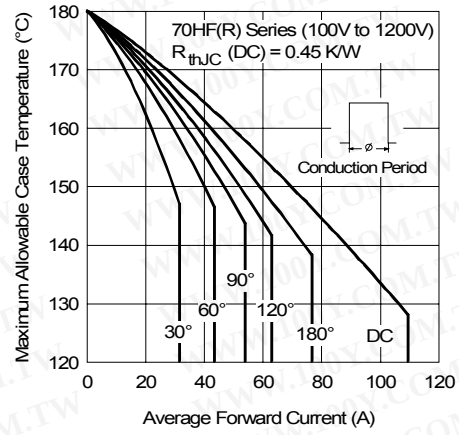


Fig. 2 - Current Ratings Characteristics

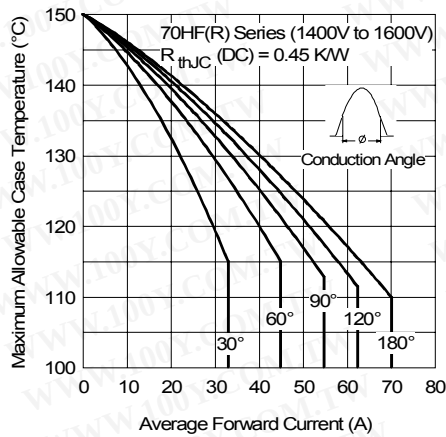


Fig. 3 - Current Ratings Characteristics

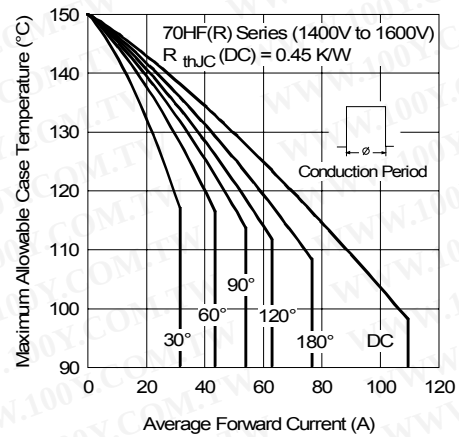


Fig. 4 - Current Ratings Characteristics

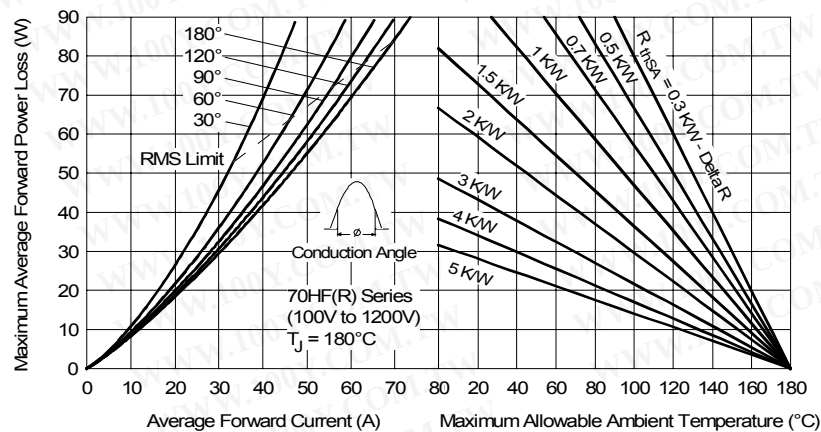


Fig. 5 - Forward Power Loss Characteristics

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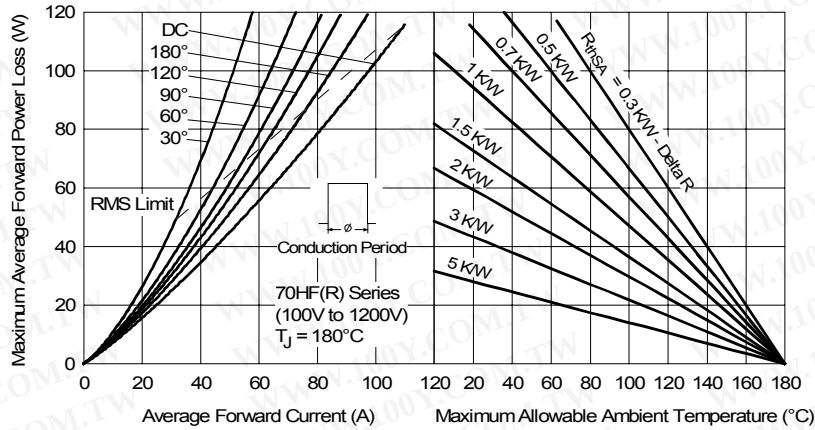


Fig. 6 - Forward Power Loss Characteristics

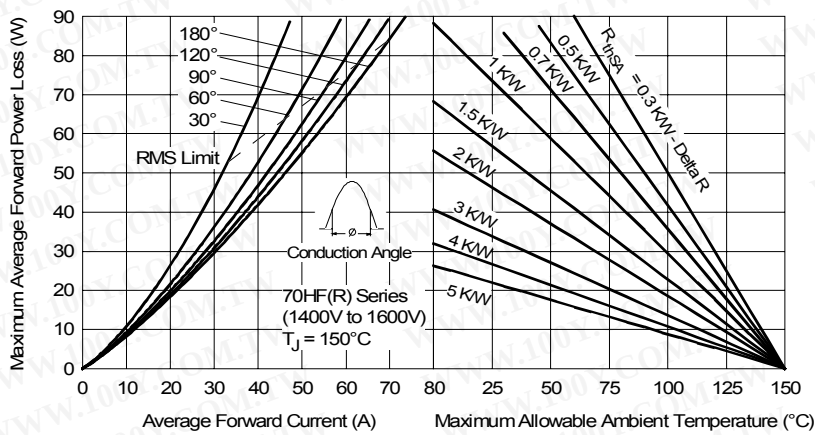


Fig. 7 - Forward Power Loss Characteristics

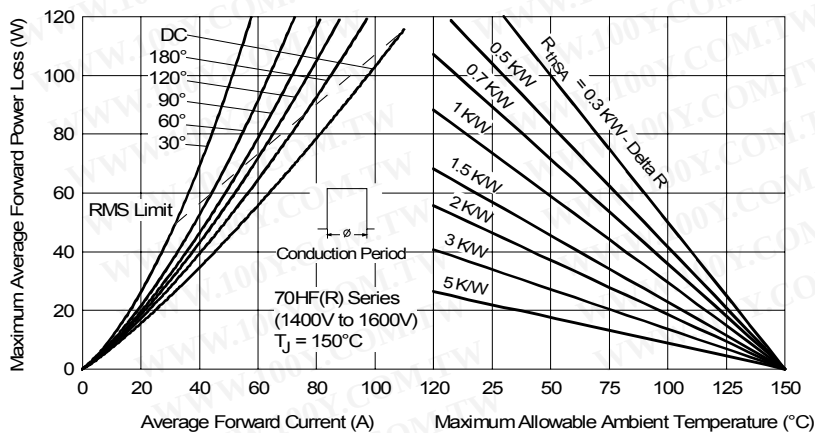


Fig. 8 - Forward Power Loss Characteristics

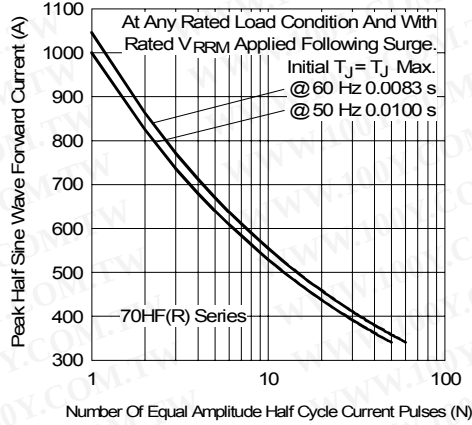


Fig. 9 - Maximum Non-Repetitive Surge Current

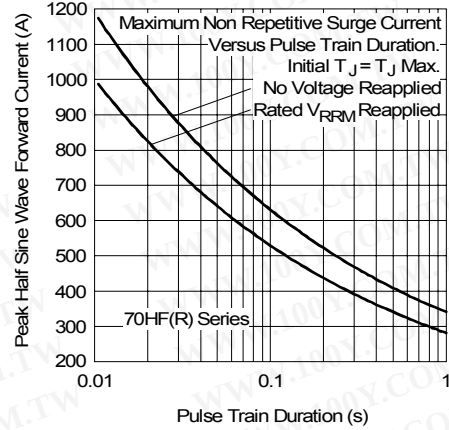


Fig. 10 - Maximum Non-Repetitive Surge Current

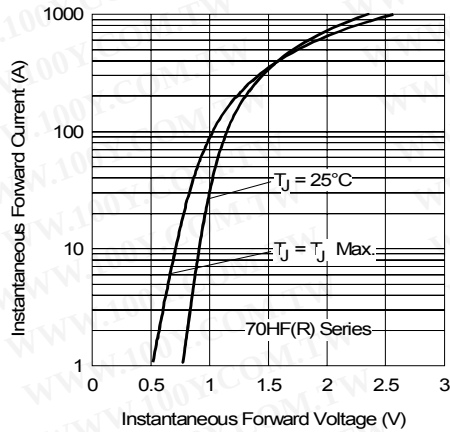


Fig. 11 - Forward Voltage Drop Characteristics

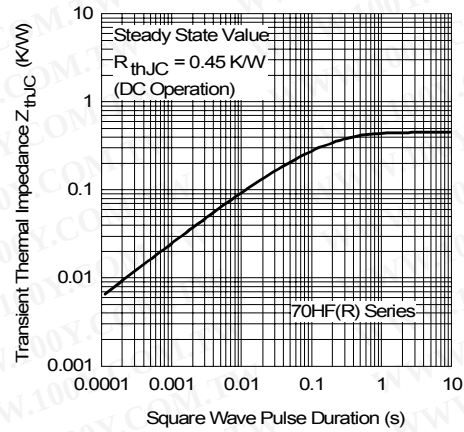


Fig. 12 - Thermal Impedance Z_{thJC} Characteristics

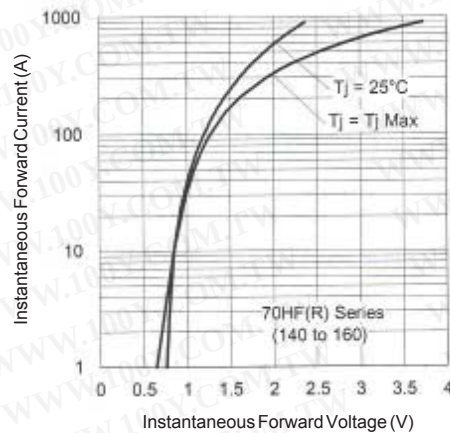


Fig. 13 - Forward Voltage Drop Characteristics